

WHAT IS CLAIMED IS:

1. A process for producing uretdione group-containing polyaddition products,  
which are solid below 40°C and liquid above 125°C, which comprises  
5 reacting in a static mixer

A) a uretdione group-containing polyisocyanates with an average  
isocyanate functionality of at least 2.0, and

10 B) up to 70 wt.%, based on the total weight of components A) and B), of  
a diisocyanate other than A), with

C) a polyol having a number average molecular weight of 62 - 2000 and  
an average functionality of at least 2.0, and

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D) up to 40 wt.%, based on the total weight of components C) and D), of  
a monofunctional isocyanate-reactive compound,

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at an equivalent ratio of isocyanate groups to isocyanate-reactive groups of  
1.8:1 to 0.6:1.

2. The process according to Claim 1 wherein uretdione group-containing  
polyisocyanate A) is prepared from a diisocyanate which has aliphatically  
and/or cycloaliphatically bound isocyanate groups.

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3. The process according to Claim 1 wherein uretdione group-containing  
polyisocyanate A) is prepared from 1,6-diisocyanatohexane and/or 1-  
isocyanato-3,3,5-trimethyl-5-isocyanatomethylcyclohexane.

4. The process according to Claim 1 wherein polyol C) comprises a polyhydric alcohol having a molecular weight of 62 to 400, and/or a polyester or polycarbonate polyol.
5. The process according to Claim 1 wherein the polyol C) comprises a diol having a molecular weight of 62 to 300, and/or a polyester or polycarbonate diol having molecular weights of 134 to 1200.
6. The process according to claim 1 wherein polyol C) is a mixture of  
0 to 100 wt.%, (based on the weight of polyol C), of a polyester diol having a molecular weight of 134 to 1200, and  
0 to 80 wt.%, (based on the weight of polyol C), of a diol having a molecular weight of 62 to 300.
7. A process for producing uretdione group-containing polyaddition products, which are solid below 40°C and liquid above 125°C, which comprises reacting in a static mixer
  - A) a uretdione group-containing polyisocyanates with an average isocyanate functionality of at least 2.0, and
  - B) up to 70 wt.%, based on the total weight of components A) and B), of a diisocyanate other than A), with
  - C) a polyol having a number average molecular weight of 62 - 2000 and an average functionality of at least 2.0, and
  - D) up to 40 wt.%, based on the total weight of components C) and D), of a monofunctional isocyanate-reactive compound,

at an equivalent ratio of isocyanate groups to isocyanates-reactive groups of 1.8:1 to 0.6:1 wherein the static mixer contains least one mixing zone and a subsequent reaction zone.

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8. The process according to Claim 7 wherein uretdione group-containing polyisocyanate A) is prepared from a diisocyanate which has aliphatically and/or cycloaliphatically bound isocyanate groups.

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9. The process according to Claim 7 wherein uretdione group-containing polyisocyanate A) is prepared from 1,6-diisocyanatohexane and/or 1-isocyanato-3,3,5-trimethyl-5-isocyanatomethylcyclohexane.

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10. The process according to Claim 7 wherein polyol C) comprises a polyhydric alcohol having a molecular weight of 62 to 400, and/or polyester or polycarbonate polyol.

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11. The process according to Claim 7 wherein the polyol C) comprises a diol having a molecular weight of 62 to 300, and/or a polyester or polycarbonate diol having molecular weights of 134 to 1200.

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12. The process according to Claim 7 wherein the polyol C) is a mixture of 20 to 100 wt.%, (based on the weight of polyol C), of a polyester diol having a molecular weight of 134 to 1200, and 0 to 80 wt.%, (based on the weight of polyol C), of a diol having a molecular weight of 62 to 300.

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13. The process according to Claim 7 wherein the static mixer contains at least one zone, the temperature of which may be separately controlled.

14. The process according to Claim 7 wherein the static mixer contains a mixing zone heated to a temperature of up to 140°C and a subsequent reaction zone heated to a temperature of 60 to 180°C.